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## ABSTRACT

Cognitively oriented research on writing has altered the manner in which writing is understood and taught. In the 1970s, writing teachers were challenged to improve students' skills. Finding traditional, product-oriented methods inadequate, they were left to discover how they might guide students to develop their skills. L. Flower and J. R. Hayes' cognitive model of the composing process captures the recursive nature of writing and is as complex as the writing process itself. Flower and Hayes focused on three subprocesses critical to composing: planning, translating, and reviewing. However, the model does not account for external factors which may influence the composing process. The unique methodology of cognitive research, protocol analysis, has led to understanding the composing process, which has reinforced the power of the tool itself. The rich descriptions protocol analysis offers and the small samples it studies may appear less rigorous than conventional techniques, yet they are both necessary and effective in achieving an understanding of the writing process. Cognitive research's understanding of effective prose, coupled with insights on the processes and subprocesses associated with its production, directs teachers to intervention techniques focusing on writing in process rather than finished products. Approaches complementing cognitive research on writing contrast with traditional, product-oriented programs, particularly regarding assessment. The next logical step in research on writing involves using this tool to explore the manner in which cognition and context interact in the composing process. (Contains 69 references.) (RS)

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A CRITIQUE OF COGNITIVE RESEARCH ON WRITING FROM THREE CRITICAL  
PERSPECTIVES: THEORETICAL, METHODOLOGICAL, AND PRACTICAL

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INTRODUCTION

Cognitively-oriented research on writing explores the qualitative act of composing. Its thrust is an attention to writers' preparation of text in process--a focus on mental processes, not written products. Over time, this research (e.g., Flower and Hayes, 1980) has described, in rich detail, the dynamic system of cognitive subprocesses writers juggle when composing. It includes an understanding of what expert writers do as they prepare effective prose and an explanation of how writing skills are likely to develop over the course of time. Its theories about writing and thinking have been generalized across education to associate learning with the act of thinking. The result has been a shift in the focus of instruction itself from product to process. The effects of cognitive research on writing evident, it seems appropriate at this point to evaluate its theoretical insights, its qualitative methods, and its impact on educational practice. To satisfy this aim, I begin by describing the conditions under which cognitively-oriented research on writing appeared necessary.

TOWARD PROCESS-ORIENTED RESEARCH ON WRITING

Multiple factors explain the surge in research on writing over the past two decades and its shift toward process. By the late 70s, a nation-wide decline in students' writing skills (Shaughnessy, 1977) placed a tremendous burden on educational institutions, particularly postsecondary institutions, to provide intervention programs. The design of such programs appeared problematic from the start. Through the 70s, writing remained embedded in the field of English and was best understood as a text or product which replicated the abstract virtues of literary works. The thoughtful activity from which text emerges, as it differs from an after-the-fact textual analysis, was not likely to receive attention in studies of literature or in composition courses. No firm knowledge base existed to direct the much-needed skills oriented programs. As a result, early attempts to develop writing programs rested with teachers' efforts to determine the level of skills their weak writers brought to class and to tailor instruction around these (North, 1987).

Writing teachers conducted their informal studies in the classroom. Assuming a secondary role as researchers, they interviewed and observed writers, often asking questions during the act of composing. Emig (1971), for example, identified writers' tendencies to review and revise; Beach (1976) detected the variation, among his students, in both type and degree of revision; and Murray (1978) learned that many writers, not knowing when to stop or when to make changes, did not understand their composing activity at all. While teacher-researcher

findings were informative, they offered only the narrow glimpses of individuals writers performing in particular classroom settings. No coherent body of literature explaining the act of composing emerged from the numerous informal studies teachers conducted (Brandt, 1990).

Efforts to explain writing were not confined to narrow attempts in classroom settings, however. What teachers targeted intuitively paralleled the research tradition of cognitive psychology, whose general focus includes the exploration, description, and explanation of mental activity. Within this field, research on writing assumed a formal posture (Gregg and Steinberg, 1980). In laboratory settings, the act of preparing text was investigated systematically through clinical interviews and protocol analysis. Particularly noteworthy are the contributions of Bereiter and Scardamalia (1980, 1982), a team of cognitive psychologists involved in clinical research with grade-school children. Their work provides a developmental perspective on the writing process, which is necessary for the consistency and integrity of instruction across levels. Extremely important to college-level writing and the field in general are the numerous studies of Flower and Hayes, a team composed, respectively, of a university writing program director and a cognitive psychologist. Reuniting writing and thinking, Flower and Hayes (1980a, 1980b, 1981a, 1986) captured the essence of composing as a dynamic system rather than a series of discrete steps. Their detailed descriptions account for

prototypal writing activity as well as the differences separating expert and novice writers.

Overall, cognitive research on writing has introduced insights which have altered instruction dramatically. As the following critique from theoretical, methodological, and practical perspectives suggests, however, the success of this new research orientation represents only the beginning of an indepth understanding of writing.

#### THEORETICAL INSIGHTS AND LIMITATIONS

Flower and Hayes' (1980a) cognitive model of the composing process captures the recursive nature of writing. Writers juggle multiple constraints and subprocesses when they prepare text, moving forward and backwards in the process. As the act of composing unfolds in Flower and Hayes' rich theoretical descriptions, the enormous cognitive strain writing imposes on individuals becomes evident. Writers engage in planning, writing, revising, and editing activities simultaneously. They appear to create and re-create knowledge, goals, and text with each sentence they formulate, orchestrating or organizing goal-directed thinking processes continuously. As Flower and Hayes depict writing in this manner, their insights on the process correlate with and possibly explain the frustrations and attitudes often associated with writing. If writing involves an ongoing re-creation of knowledge, then inexperienced writers' tendencies to drift from topics, lose focus, become anxious, or

give up are more clearly understood. Furthermore, the authors' thorough description of the multiple, perhaps unmanageable processes embedded in composing activity is essential in those situations where teachers' skills are so automatic that they cannot imagine the challenges composing presents to students who lack experience, practice, and direction.

Also included in Flower and Hayes' (1980a) model is a theoretical explanation of how a writer's intentions are actually conveyed. Attempting to meet the goals of a writing task, writers first deal with incoherent thought and loosely related pockets of information. As they proceed to prepare text, they seem to transfer these into a highly conceptualized and precisely related knowledge. Once this transfer is achieved, writers appear ready to translate ideas into words. Speculating about the transformation of ideas into prose, Flower and Hayes emphasize the role thinking plays in the production of text. Their efforts to capture the essence of composing elevates discussions of writing, shifting their focus from the conventions of grammar to the essential yet challenging features of writing, such as logical flow and cohesion. Theorizing about the act of composing in this manner, Flower and Hayes introduced both researchers and teachers to an entirely new way of looking at writing. They began to construct the knowledge base shaping a "new" domain.

In many ways, Flower and Hayes' model is as complex as the writing process itself is. The authors themselves obviously recognized this point, for when they introduced the model, they

focused a great deal on the three subprocesses critical to composing: planning (developing an agenda), translating (producing language), and reviewing (reading and editing). While this effort to present a basic framework could be misinterpreted, leading some readers to conclude that writing is linear rather than recursive, a basic structure outlining the writing process is sensible and necessary. It establishes a language about writing which unifies professional discussions surrounding it. Most important, this basic overview of writing directs application. The careful delineation of the three subprocesses informs teachers about the mental processes activities in the classroom stimulate.

Complementing Flower and Hayes' rich descriptions of prototypal writing activity are Bereiter and Scardamalia's (1982) theories about the role metacognition--executive control management--plays in the writing process. This mechanism controls the act of producing text. It enables writers to determine when they should move from one process to the next--when to search for knowledge, bring knowledge in at the right time, make decisions, and switch between the forward process of text generation and the backwards process of evaluation. Describing this control and management behavior, Bereiter and Scardamalia enhance the cognitive model, accounting for a monitoring activity which theories about the teaching of writing must include. Additionally, the mechanism they identify characterizes expert writing--another topic explored fruitfully in cognitive research on the writing process.

Research on expert/novice writers identifies the many qualitative differences separating the two skill levels. Flower (1979) claims, for example, that expert/novice differences rest with the retrieval of information from long-term memory as it is stimulated by the writer's response to a task. Novice writers tend to demonstrate a "what's next" approach to writing, searching for a new idea only when the idea preceding it has been developed fully (Bereiter, 1980). Inexperienced, they retrieve information and report it in a writer-based form which fails to accommodate and acknowledge a reader (Flower, 1979).

In the transcripts of other writers, however, Flower and Hayes (1986) detected an ability to transform knowledge. These expert writers seemed to synthesize information, re-arranging their material and locating what may appear weak, to prepare prose which accommodates a reader. Expert writers can detect dissonance in their work, perhaps an incongruity between intention and execution. Critical to expert writing, Flower and Hayes concluded, are knowledge of a specific topic, knowledge associated with the writing domain, and strategic knowledge. These enable competent writers to analyze and design tasks in a personal manner, to identify and retrieve those procedures on which to draw, to monitor and direct their work to a satisfactory end, and to detect consciously the communicative intent of their written language (Bartlett, 1982). Perhaps the most startling discovery of cognitively-oriented research, then, is the realization that deficient writers' problems are far more serious than the superficial mechanical errors readers are

likely to notice (Flower and Hayes, 1986). Novices' prose lacks the thoughtful shaping of information for readers (Flower, 1979).

With Bereiter's (1980) theory on the developmental stages of writing, the gap separating experts and novices is qualified further. The stages of writing consist of associative writing, a minimally demanding pattern of reaching for thoughts; performative writing, a form of associative writing which demonstrates good control over mechanics; communicative writing, writing shaped for an audience; unified writing, writing in which the writer uses him/herself as a critical reader or model of the audience; and, finally, epistemic writing, writing which functions as a means of questing for knowledge. With some variation, Bereiter claims, writing appears to develop sequentially in this seemingly natural pattern paralleling the decline of egocentrism, the development of social perceptivity, and the emergence of formal operations. This theory on writing offers a continuum along which skills may fall. It is beneficial to practice, offering writing teachers a means for diagnosing, facilitating, and measuring developing writing skills.

Cognitive research on writing has organized the domain. It has captured the qualitative nature of composing which text-centered methods fail to detect--the cognitive subprocesses embedded in the act of preparing text. It accounts for expert writers' sophisticated, simultaneous management of a knowledge base consisting of declarative knowledge (conventions of

writing, such as punctuation), procedural knowledge (knowing how to integrate information, for example), and meta-knowledge (the individual writer's understanding of his/her composing activity). This understanding of the composing process has facilitated the emergence of the writing domain as it differs from English and literature, which focus on text rather than process.

Additionally, this orientation to process has established a tradition in research on writing which has extended to organize research across education in general. Some may regard this trend in education as an obvious change associated with a major paradigm shift. While this point is not inaccurate, a more valid explanation exists. Cognitively-oriented research (e.g., Bereiter and Scardamalia, 1980, 1982; Flower and Hayes, 1980a, 1980b, 1981a, 1986) on writing has identified its cognitive components, as well as those of reading and thinking as they emerge in the writing process. The act of thinking constitutes cognitive theory, and the skill's critical role in learning has been generalized across domains. With this shifting focus in education, insights on cognition continue to emerge, driving research further. Emerging concepts, such as the transfer of learning and theories on writing to learn, suggest a developing relationship between research and instruction. The plausible, practical explanations offered in cognitively-oriented studies of writing illustrate the dynamic, informative relationship theory and practice can share.

While the benefits of cognitive research on writing are far-reaching and many, the body of literature it offers cannot be accepted as the definitive, exhaustive account of composing. Attempting to capture what writers typically do when preparing text, cognitive research offers a limited account of a diverse, dynamic process (Petrosky, 1983). It does not, for example, explore individual differences among writers or variations in the sequencing of subprocesses beyond those of experts and novices (Berkenkotter, 1991). Consequently, Flower and Hayes' informative model often appears mechanical or reductionist to those reviewing it (Rose, 1988). It does not account for the external factors which may influence the composing process.

The fact that cognitively-oriented research accounts for expert/novice differences suggests that it can explore composing further. The verbalizations recorded in this type of research through protocol analysis include the many thoughts writers entertain while preparing text. These may explain how individual writers respond differently to the settings in which they write or how their performance varies with the knowledge and experience they bring to the task (Best, 1990). Of these features shaping the writing context, only rhetorical task emerges in the literature on research on writing, yet it appears to be a design component rather than a variable. Across studies, Flower and Hayes and Bereiter and Scardamalia emphasize the critical role task representation plays in the writing process, yet they never explain the specific tasks prescribed or their effects.

Constructed as it is, cognitive research on writing does not account for a separate body of literature focusing on the external factors influencing language. This perspective on language draws from, most obviously, Vygotsky's (1978) insights on the sociocultural roots of language and development and Freire's (1970) understanding of language as a liberating force grounded in the social context. From these, Heath's (1984) valid insights on language in community follow and are, indeed, relevant to the act of composing. In her rich ethnographic study of life and language in the Piedmonts, Heath observed how individuals engage in and complete literate acts with others. Through linguistic activity, these individuals affirm their language and thought, as they have emerged through and reflect life's experiences. Accordingly, writers' management of composing activity, the information they share, and their manner for presenting it rests with internal processing activity and external factors. Attitudes, life experiences, the values of others, or the effects of formal schooling are likely to influence the preparation of text. Not accounting for these, the cognitive model appears incomplete.

#### BENEFITS AND DRAWBACKS OF THE QUALITATIVE METHODS EMPLOYED IN COGNITIVE RESEARCH ON WRITING

Attending to process and seeking prototypal activity, cognitive research employs qualitative rather than quantitative methods. Unique in many ways, this type of research draws criticism frequently. Its methodology is both necessary and

appropriate, however, for only through a cognitive approach can the thoughtful activity--the how of writing, in this case--be captured and subsequently analyzed in a manner benefiting educational practice (Schrivver, 1989).

Sample size, sampling technique, and the research setting are unique features of cognitive research on writing (North, 1987). Most studies of the process focus on fewer than 20 subjects. This sample size is influenced by the principal data-gathering technique, protocol analysis. Since this technique tends to generate a tremendous amount of data, a study consisting of a large number of subjects would delay research efforts considerably. Sampling is largely influenced by the research setting. Since investigations of composing are most often conducted at universities, given their research orientation and their practical concerns about skills, students frequently serve as subjects--perhaps to earn money or credit or to fulfill certain course requirements. These students are particularly good subjects, given the data-collection techniques employed (protocol analysis and interview). The ability to verbalize composing activity and review it retrospectively is a critical component of this research, especially in its initial stages, when basic processes must be identified. The experienced student is likely to provide valid, informative data. However, he/she prepares writing samples in a laboratory setting, not a classroom. This condition is alarming to those attentive to social theory and the dynamics of various educational settings (Cooper and Holzman, 1989).

With its size and sampling techniques, cognitive research on writing is often criticized for not adhering to the conventions of scientific research (Lindemann, 1987). Since studies do not target a representative population, they may report, according to the logic associated with conventional research, results which are not generalizable (Williamson, Karp, Dalphin, and Gray, 1982). While such criticism reflects an informed response to research design, the exploratory nature and narrow focus of research on writing justify methodology. Aware of the limitations qualitative studies introduce, researchers tend to employ measures which might insure the quality of their work. They are likely to conduct pilot studies to evaluate procedures and devise reliable coding schemes and perform inter-rater reliability tests on the coding of data (Patton, 1987).

Another methodological feature which draws criticism is protocol analysis, the principal data-collection technique of cognitive research. In research on writing, protocol analysis elicits writers' ongoing verbalization of their composing activity. To prepare for this type of exercise, writers engage in warm-up exercises which orient them to the process of talking aloud. Prepared, experienced subjects demonstrate the ability to verbalize the decision-making, translating, and reviewing in which emerge in their production of text (Flower and Hayes, 1980a). This technique yields rich data; subjects composing 200-300 word writing samples, for instance, are likely to generate well over 2000 words as they write (Best, 1994). When analyzed according to a carefully-devised and adequately-tested

coding scheme, these data are transformed into an organized body of empirical evidence in which theories can be grounded (Glaser and Strauss, 1967).

The careful coding of these data is essential for reliable results in data analysis. Since writers' verbalizations are classified on both descriptive and inferential levels (Flower and Hayes, 1981b), many inconsistencies can emerge if the coding of explicit actions and processing implied is not accurate across raters. In those cases in which one experimenter codes data, reliability is also problematic. A single rater may offer a subjective or biased analysis of data. Since coded data introduce a variety of potential problems, triangulation is often employed to achieve accuracy in data analysis (Patton, 1987). In research on writing, for example, subjects are usually interviewed, the data they offer employed to confirm, challenge, or enhance the conclusions researchers initially infer.

Although protocol analysis suits the objectives of this research orientation, it is not a popular technique (Brandt, 1990; North, 1987). Use of the tool consumes a tremendous amount of time. A single writing session, during which a 250-300 word essay is prepared, may run for 2 hours or more (Best, 1990). During this time, the experimenter manages recording equipment; observes and notes subjects' physical behaviors; and intervenes, when and if necessary, to keep the writer engaged in talking and writing. Given the circumstances under which protocol data are gathered, the process may appear

to be the antithesis of the quiet, natural process of composing in isolation (North, 1987). Practiced, engaged writers, however, demonstrate an ability to attend to the writing process, despite conditions imposed by methodology (Best, 1994). Based on the rich transcripts Flower and Hayes cite in their numerous studies, the criticism North reports appears unfounded.

Another drawback associated with this technique involves the tremendous amount of data it yields. Given the lengthy transcript a single writing session is likely to generate, data analysis in cognitive research on writing might appear unwieldy and impossible. This claim is valid, yet researchers do not respond to it by discarding the tool. Rather, they employ the technique, controlling the scope of their work to create a manageable task. They may, for example, limit their work to how writers get started, how writers demonstrate attention to audience, or what writers do when they pause. Such decisions are quite appropriate, provided a sound rationale for any action taken is given. This practice is evident in research on writing to date. To offer an overview of the composing process, for example, Flower and Hayes disregarded data not tied explicitly to the act of translating information onto paper. Their studies, as a result, reflect a controlled use of protocol analysis, one appropriate for constructing prototypal behavior but incomplete in terms of achieving a thorough understanding of the writing process. In essence, Flower and Hayes have laid the groundwork for subsequent research on writing. Having identified and tested an appropriate tool for research on

writing, they point to the next logical step: employing protocol analysis to examine verbalizations other than those explicitly tied to text. These segments may offer information on external factors influencing the composing processes of individual writers in unique ways (Best, 1990, 1994).

The qualitative methods characterizing the shifting focus in research on writing contrast those of quantitative methods. The rich descriptions this type of research offers and the small samples it studies may appear less rigorous than conventional techniques, yet they are both necessary and effective in achieving an understanding of the writing process. Their rigorous use is modeled well in the studies conducted to date, offering sound direction for subsequent research in the field.

#### ISSUES IN IMPLEMENTATION

Cognitive research on writing has guided educational practice. Identifying expert/novice differences, it sets forth a qualitative description of effective writing as the "cognitively demanding transformation of the natural private expressions of writer-based thought in a structure and style adapted to a reader" (Flower, 1979, 20). This understanding of effective prose, coupled with insights on the processes and subprocesses associated with its production, directs teachers to intervention techniques focusing on writing in process rather than finished products.

In today's writing classes, teachers facilitate student-centered instruction. Integrating techniques such as conferencing, collaboration, and reciprocal learning into the curriculum, they guide student writers to evaluate their intentions, strategies, and performance each time they compose (Elbow and Belanoff, 1989). Textbooks (e.g., Ede, 1989; Hunt, 1991) offer students checklists and self-assessment questionnaires through which they can evaluate their skills. Class time focuses on work in process. Students discuss and analyze tasks, benefiting from their instructors' and peers' insights as well as the self-reflection and revising these generate. They are guided to develop sound strategies for organizing material and for examining their work objectively to revise and accommodate others' perspectives without losing their own voice. In a well-conducted process-oriented class, students can return to and re-consider any piece through the course of the term, for the act of thinking about one's work is the heart of instruction (Berthoff, 1981).

Writing instruction is directed further by the descriptions and analyses of the gap in thinking which separates weak and competent writers (Flower and Hayes, 1986). This information, when considered in light of broader insights on methods for progressing toward expert behavior (Case, Sandieson, and Dennis, 1986) reminds writing teachers that no simple, immediate means for resolving obvious weaknesses exist. The gap between novice and expert writers so wide, their thinking and processing so different, novices cannot envision nor imagine the recursive

thought effective writing reflects. As a result, writing instruction targeting expert performance has assumed a developmental perspective. Given a writer's skills, his/her improvement or growth comes about through a carefully-graded process. A developmental approach monitors existing skills, always targeting instruction slightly ahead of students' skill level (as is appropriate for an individual and his/her rate of progress). This process is an ongoing one extending across a broad time span. Its aim is to work toward the end goal--mastery of skills--while avoiding any rapid progression which could startle or arrest the learner (Markman, 1985).

With this emphasis on developmental learning and the relationship between writing and thinking have come changes in materials used in the classroom. Flower's (1985) rhetoric offers the most comprehensive, thought-provoking, and carefully written guide for both teachers and students. This text offers a sequenced presentation of traditional topics, such as discovery, audience, and persuasion, from a writer's perspective. In doing so, it guides students through the critical thinking associated with the production of text. The author stimulates students to reflect on themselves as writers and to consider the manner in which they establish and execute operational goals, talk to their readers, construct issue trees, prepare prose, and revise. Governing the text is the author's regard for writing as a problem solving activity characterized by decision making, goal-setting, and choices which direct the conscious act of communicating.

Flower's text parallels her research. It targets the essence of composing--the processes writers juggle as they prepare text. However, other so-called process-oriented texts (e.g., McCleary, 1988; Neeld, 1986; Pickering, 1991) fail to capture the dynamic nature of composing. Because of their presentation, lay-out, or language, these appear to depict writing as linear rather than recursive. Perhaps these texts reflect a serious problem accompanying the shift toward process-oriented research on writing: a misinterpretation of its focus and findings (Lindemann, 1987). The word process, as it has emerged in this research, has become a popular term. Unfortunately, however, it has come to mean different things to different people. From the literature, for example, some individuals may conclude that the writing "process" consists of a series of progressive acts rather than a dynamic system of recursive activity. Their concept of process instruction differs dramatically from that which Flower proposes in her research, her instructional materials, and her teaching. Such difficulty with this term may reflect a critical problem in the field: the gap separating theory and practice.

Equally serious, cognitively-oriented insights on writing are in direct conflict with formal schooling in those situations where a focus on product or text contrasts instruction (Brandt, 1990). This point is most clearly understood in issues regarding assessment. In process-oriented writing classes where cognitive research is applied, instruction is based on qualitative approaches to learning. Class activity involves

discussion, collaboration, problem solving, and peer response. In some situations, this activity is in conflict with the larger context--the school itself, however--when it promotes the quantification of students' skills and their ranking across the cohort group on local, county, state, and national levels (Paris, Lawton, Turner, and Roth, 1991).

When assessment, on the whole-school level, assumes an orientation to product, teachers are confronted with a dualism: the conflict between process instruction and product assessment. Innovative methods for assessing writing, such as portfolios, observation, and interview, may be employed in the writing class, but these will not really "count" when the school requires and society focuses on quantitative assessment. Even worse are those situations in which a particular class is process-oriented while its assessment focuses on product. Inconsistencies like these illustrate the most alarming outcome associated with cognitive research and its implementation: educational practice in which instruction and assessment represent separate, conflicting concepts rather than an integral event (Glaser, 1981).

Overall, cognitively-oriented insights on writing have benefited educational practice tremendously, guiding the development of methods and materials designed for teaching and assessing writing as a process. In general, the application of this theory has been relatively smooth simply because writing teachers have been involved in research or have turned to it for solutions to the problems they encounter in the classroom. As

the preceding discussion suggested, however, implementation has not been flawless. Those teachers lacking a strong theoretical base may misinterpret cognitive research. The structure of schooling itself may interfere with implementation. Approaches complementing cognitive research on writing do, indeed, contrast traditional, product oriented programs. As a result, implementing process instruction, to include assessment in particular, may indeed involve altering the manner in which society as a whole speaks about learning.

#### CONCLUSION

Cognitively-oriented research on writing has altered the manner in which writing is understood and taught. Two decades ago, writing teachers, across levels, were challenged to improve students' skills. Finding traditional, product-oriented methods inadequate, they were left to discover how they might guide students to develop their skills. Today, however, a rich body of literature describes the writing process, the differences between expert and novice writers, and the developmental stages of writing. One individual in particular has played a tremendous role in implementing the insights cognitive research has introduced. As a writing instructor and researcher, Flower focuses on both theory and practice. In her work, the gap separating research and instruction closes, offering teachers clear direction and a sound rationale for implementing process instruction.

Central to this type of instruction is an understanding of the critical role thinking plays in the writing process. The unique methodology of cognitive research, protocol analysis, has led to this understanding, which, in turn, has reinforced the power of the tool itself. Looking beyond the benefits of existing studies and identifying their limitations, the next logical step in research on writing involves utilizing this powerful tool to explore the manner in which cognition and context interact in the composing process. Research along this line will enhance literature on writing, offering some understanding of what individual writers, influenced by certain external factors, do when they prepare text.

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